



H. W. Mapleton - Bree

---

Allesley.







# BRITISH LIBELLULINÆ;

OR,

## DRAGON FLIES.

ILLUSTRATED IN A

SERIES OF LITHOGRAPH DRAWINGS,

WITH A

BRIEF DESCRIPTION OF THE INSECTS, TIMES OF APPEARANCE,

&c.

---

BY

W. F. EVANS, M.E.S.

---

PRINTED FOR PRIVATE CIRCULATION.

London :

PRINTED BY J. C. BRIDGEWATER, SOUTH MOLTON STREET, OXFORD ST.

---

1845.

THE UNIVERSITY OF CHICAGO

DEPARTMENT OF CHEMISTRY

RESEARCH REPORT NO. 10

1954

THEORY OF A QUANTUM MECHANICAL

SYSTEM WITH A CONTINUOUS SPECTRUM

BY J. H. VAN VLEET

RECEIVED JANUARY 1, 1954

REVISION RECEIVED MARCH 1, 1954

ACCEPTED FOR PUBLICATION MARCH 1, 1954

W. H. WATKINS, JR.

PHYSICS DEPARTMENT, UNIVERSITY OF CHICAGO

CHICAGO, ILLINOIS

1954

RESEARCH REPORT NO. 10

1954

# LIST OF THE PRINCIPAL WORKS, AND AUTHORS REFERRED TO.



- BARB.—Genera Insectorum of Linnæus. Exemplified by various specimens of English Insects. By James Barbut. 4to. London: 1781-3.
- BURTON.—John Barlow. Lectures on Entomology. 8vo. London. 1837.
- CHARP.—Libellulinæ Europææ, a Toussaint de Charpentier. 4to. Lipsiae. 1840.
- CURTIS, JOHN.—British Entomology; or, Illustrations and Descriptions of the Genera of Insects found in Great Britain and Ireland. 8vo. London: 1824, &c.
- DON.—Edward Donovan. Natural History of British Insects. Royal 8vo. Lond.: 1792—1809.
- DE GEER.—Charles Baron de Geer. Memoires pour servir a l'Histoire des Insectes. 4to. Stockholm: 1752—1778.
- ENTOMOLOGISTS' Useful Compendium, &c. Geo. Samouelle. 8vo. London: 1824.
- HARR.—An Exposition of English Insects. By Moses Harris. 4to. London: 1781. The Aurelian; or, Nat. Hist. of English Insects. 1766. Fol. 1776—1782. Lond. 4to.
- KIRBY and SPENCE's Introduction to Entomology. 8vo. London: 1828, &c.
- MILLARD, Simeon Warner.—Outlines of British Entomology. 8vo. Bristol. 1821.
- PANZ.—G. W. Panzer.—Faunæ Insectorum Germanicæ initia, or, Deutschland's Insecten. 12mo. Nuremberg: 1796, &c.

- PETAGNA.—V. Petagna.—*Institutiones Entomologicae*. 8vo. Naples: 1792.
- RÆSEL.—A. J. Ræsel de Rosenhof. *Insecten Belustigungen*. 4to. Nuremb.: 1746, &c.?
- REAUMUR.—R. A. Ferchault de Reaumur. *Memoires pour servir a l'Histoire des Insectes*. 4to. Paris: 1734—1742.
- STEPH.—*Illustrations of British Entomology*. 8vo. By James F. Stephens. London, 1828, &c.
- SULZ.—J. H. Sulz.—*Die Kelnzeichen der Insectin*. 4to. Zurich: 1761.
- SCHAEFF.—J. C. Schæffer.—*Icones Insectorum circa Ratisbonam Indigenorum*. 4to. Ratisbonne. 1769.
- VANDER LINDEN.—*Monographia Libellularum Europæarum*. P. L. Vander Linden. 8vo.
- VILL.—Charles de Villers.—“*C. Linnæi Entomologia*.” 8vo. Lugduni: 1789.
- WAKEFIELDS.—*Introduction to the Natural History of Insects*. By Priscilla Wakefield. 8vo. London: 1816.



## DESCRIPTION OF THE PLATES.

- Plate 1.*—Fig. 1. A small portion of the eye of *Libellula depressa*. 2. Antenna of *Agrion puella*. 3. Antenna of *Æshna maculatissima*. 4. Antenna of *Libellula depressa*. 5. Mandibles of *Æshna maculatissima*. 6. Maxillæ of *Libellula depressa*. 7. Labrum of *Libellula depressa*. 8. Labium of *Libellula depressa*. 9. Apex of abdomen of *Calepteryx hæmorrhoidalis*, male. 10. Part of abdomen of ditto. *a*. Opening to sexual organ. 11. Lamellated appendage of *Æshna maculatissima*. 11*a*. Lamellated appendage of *Gomphus flavipes*, (from Stephen's "Illustrations of British Entomology.") 12. Apex of abdomen of *Libellula depressa*, male. *a*. Opening to sexual organ, 13. Tarsi of *Agrion furcatum*. 14. Tarsi of *Libellula depressa*. 15. Tarsi of *Æshna maculatissima*. 16. Prehensile organ of male *Libellula*, *a* moveable hooks encompassing the points \* of the process *b*; *c* processes of the 2nd division of the organ, between which the hook *d* lies. *e*. 3rd division of the organ, (from Shuckard's Translation of Burmeister.) 17. Breathing apparatus of *Æshna*. 17*a*. The same open. 18. Mouth-piece of *Libellula depressa*, side view. 18*a*. The same, front view. 18*b*. The same, underneath. 19. Larva of *Calepteryx*. 20. Larva of *Æshna*. 21. Larva of *Libellula*.
- 2.—Fig. 1. Upper wing of *Agrion puella*. 2. Upper wing of *Libellula depressa*. 3. Principal nervures of the upper wing of *Agrion*. 4. Of the upper wing of *Calepteryx*. 5. Of *Æshna*. 6. Of the under wing of *Æshna*. 7. Of the upper wing of *Libellula*. 8. Of the under wing of *Libellula*.

page

3.—	AGRION rubellum. Vander Lin. <i>f. l.</i> , .....	13
	xanthopteron, Stephens, 2. ....	
	elegans. Vander Lin. 3, 4. ....	
	ezonatum. Steph. 5. ....	14
	rubens. Evans. 6. ....	
	puella, Lin. 7, 8. ....	
4.	furcatum. Charp. 1, 2. ....	
	lunulatum. Charp. 3, 4. ....	15
	hastulatum. Charp. 5, 6. ....	
	Cyathigerum. Charp. 7. ....	
	brunnea. Evans. 8. ....	
5.	annulare. Lea. 1. ....	
	rufescens. Lea. 2. ....	
	PYRRHOSOMA minium. Charp. 3, 4. ....	16

	<i>page</i>
5. ERYTHROMMA fulvipes Steph. f. 5.....	16
Chloridion. Charp. 6. ....	
ISCHNURA pumilio. Charp. 7. ....	17
6. PLATYCNEMIS platypoda. Vander Lin. 1, 2. ....	
LESTES viridis. Vander Lin. 3. ....	
forcipula. Charp. 4. ....	18
7. CALEPTERYX Virgo. Lin. 1, 2. ....	
Ludoviciana. Lea. 3. ....	19
8. Ludoviciana. Lea. 1. ....	
hœmorrhoidalis. Vander Lin. 2, 3. ....	
9. anceps. Steph. 1. ....	
ANAX formosa. Vander Lin. 2.....	20
10. ÆSHNA rufescens. Vander Lin. 1. ....	
grandis. Lin. 2. ....	
11. maculatissima. Latr. 1. ....	21
junceæ. Lin. 2. ....	
12. mixta. Latr. 1. ....	
affinis. Vander Lin. 2.....	22
13. BRACHYTRON vernalis. Vander Lin. 1. ....	
CORDULEGASTER annulatus. Latr. 2. ....	
14. GOMPHUS vulgatissimus. Latr. 1. ....	23
flavipes. Charp. 2. ....	
CORDULIA ænea. Lin. 3. ....	24
15. metallica. Vander Lin. 1.....	
Curtisii. Dale. 2, 3. ....	
16. LIBELLULA depressa. Lin. 1, 2. ....	25
conspurcata. Fab. 3. ....	
17. quadramaculata. Lin. 1. ....	
prænubila. Newman. 2. ....	26
cancellata. Lin. 3. ....	
18. cancellata. Lin. 1.....	
cœrulescens. Fab. 2, 3. ....	
19. DIPLAX Scotica. Lea. 1, 2. ....	27
rufostigma. Newm. 3, 4. ....	
20. pallidistigma. Steph. 1. ....	
angustipennis. Steph. 2. ....	
vulgata. Lin. 3. ....	
21. basalis. Steph. 1.....	28
flaveola. Lin. 2. ....	
rubicunda. Schæf. 3. ....	

## P R E F A C E.

---

IN putting forward this little Work to the notice of his Entomological brethren, and to those, whose love for the wonderful works of the Creation has induced them to look into the beauties of the Insect world, the author has been encouraged by the oft-repeated assurance of many Entomologists of the present and former times—that one good figure of an Insect is better than the most elaborate description by itself.

The truth of the above assertion has been much vindicated by the increased number of works which have of late appeared, containing the most beautifully executed figures yet presented to the world; and it is therefore in the hope, that a figure of each of the known species of the Libellulinæ of Great Britain (one of the most interesting sections of this much neglected order of Insects) may not prove unacceptable, that he has thus employed his leisure hours, all having been drawn and coloured by the author with the greatest care from the Insects themselves. At the same time, he has been desirous of presenting them in a form accessible to those who might not be enabled to possess themselves of the more expensive and voluminous works of such Entomologists who have already described some of the Insects herein figured which are not novelties.

W. F. E.





## ORDER,—NEUROPTERA.

---

### SECTION,—LIBELLULINA. MAC LEAY.

This section of the order Neuroptera, contains some of our largest British Insects, and embraces a variety of species differing not only in the elegance of their form, but also in the beautiful colouring both of the wings and body.

The HEADS of these Insects, which assume either a spherical or a triangular shape, are large, and are provided with two compound eyes, which occupy nearly the whole exterior surface; and are said to contain, by Leeuwenhoek, more than 12,000, and by Dr. Hooke, 14,000 lenses in each. (*Pl. 1, f. 1.*)

The ANTENNÆ are short, and are placed between the eyes (*pl. 1. f. 2, 3, 4*); the Mandibles are strong and dentated (*pl. 1, f. 5*).

They have four large WINGS (*pl. 2.*) composed of a glassy substance spread on nervures through which circulation takes place, and their BODIES are long, either cylindrical as in Agrion, or flattened, as in Libellula; terminating in the males, in forcipated or lamelated appendages. (*Pl. 1, f. 9, 10, 11, 12.*)

Mons. Poupart, in the Philosophical Transactions, states, that the Insect is greatly assisted in its flight by its body being formed of separate rings, and that they act similarly to the tail of birds.—*Phil. Trans.*, 1700. Vol. 22, p. 519.

The LEGS are six in number, and the Tarsi three-jointed. (*Pl. 1, f. 13, 14, 15.*)

The sexual organs of the male are contained in the ninth segment or ring of the body, (*pl.* 1, *f.* 10, 12*a*) whilst those of the female are in the last.

These insects may often be seen flitting together over ponds, in the form of a loop; for the male, after hovering about the female, seizes her by the neck with the appendages terminating his abdomen, and by the apparatus at the base of it, (*pl.* 1, *f.* 16) whilst the female bends her body upwards and round; and from the peculiar position, it was generally believed that this was their usual mode of connexion;\* but Dr. Herman Burmeister states, that it "is merely an expression of mutual inclination," and that "the males fly at sitting females and rapidly copulate with them, like the flies,"† which fact has been confirmed by other observers.

The habits of these interesting insects are but little known, but the females, which are usually smaller than the males, deposit their eggs in the water; and, according to the account given by Mr. Patterson,‡ the females descend some inches below the surface and deposit them.

The LARVÆ (*pl.* 1, *f.* 19, 20, 21) somewhat resemble the perfect insects and live for about a twelvemonth entirely in the water, generally crawling at the bottom or on plants, and feeding with great voracity on other aquatic insects, and even on animals and small fish,|| for the capture of which they are wonderfully provided with a singular spoon-shaped apparatus (*pl.* 1, *f.* 18, 20) in lieu of a lower lip, which, when not extended, covers the face of the insect like a mask, but is capable of being extended and unfolded with the greatest rapidity, the prey being seized with the pincers of the upper part.

The Larvæ of *Æshna* and *Libellula* breathe through branchiæ situated in the colon, through which water is imbibed and rejected with bubbles of air; and they are also thus much assisted, if they do not entirely swim by this means, as their legs are then laid close to their sides, and they move at intervals. (*Pl.* 1, *f.* 17.)

Mons. Poupart, although he states this action was like breathing, imagined that it was a process of cleansing; for he says, "When the young larvæ is ready to quit its case, it dilates its belly that the water may enter, then it compresses itself to circulate the water, which it expresses and shoots out a great way.

"It continues this action with great force for sometime \* \* \* \* which may be compared to breathing \* \* \* \*

"My opinion is, that the animal does this in order to cleanse its

\* See Philos. Trans., vol. 47, p. 4.

† Mammal of Entomology. Translated from the German by Shuckard. London; 1836. p. 218.

‡ Natural History of Insects, mentioned in Shakspear. London; 1842. p. 237.

|| Ib. p. 232.



body from all excrements, in that element where it leaves its old robes to appear in a more glorious and new form in the open air."

And he continues by supposing "that cleansing themselves they are sooner able to escape from their case, which they are not longer than half-a-day in quitting."\*

In the *Philosophical Transactions* for 1749, the following very interesting account of the habits and mode of escape from their case of a species of *Libellula* found in Pennsylvania, is given by Peter Collinson, Esq., F.R.S. &c.:—he states, that "about the beginning of May, they creep out of the water and fix themselves on the shrubs and rushes. In this situation they continue but a few hours, before their back splits open, and from this deformed case creeps out a beautiful fly with shining, transparent wings. At its first appearance, there is only what one may call the rudiments of wings; but it is a most entertaining sight to observe how they shoot out and expand themselves, thus in less than an hour, they have attained their complete dimensions. During all this operation, the creatures are immoveable, and so continue till their wings are dry, and then they fly swiftly away, roving about the sides of ponds and rivers seeking their food. Being insects of prey they are very voracious, and, like the hawks among birds, are very swift of flight and nimbly secure their prey, which is mostly flies and small green grasshoppers. In cloudy weather they are rarely to be seen."—*Phil. Trans.*, vol. 47, p. 4.

This account is confirmed by Mr. Bartram, who observes that the *Libellulæ* of America, have no remarkable difference from ours; and further adds, "that they live all the year a water insect,"—that "their bodies being filled with an oily matter, they easily quit their husks;" and mentions that "the second day after leaving their aquatic abode they cast another skin, after which their tails are longer, and their wings drier and more transparent."—*Phil. Trans.*, 1750, vol. 47, p. 28.

The NYMPHS on issuing from the water, climb up the stems of plants, and splitting open their cases over the thorax the perfect insects work themselves out by degrees; at first they are quite limp and moist, but gradually their wings expand and harden, and taking flight, they appear to revel in their novel existence, and proud of their sylph-like wings, fly up and down streams, or hover over ponds, driving away all trespassers; occasionally resting on posts or plants and feeding on the unfortunate butterflies or other insects which may have been unlucky enough to fall victims to the voracity of Les Demoiselles.

Their power of flight is very great; they may often be seen an immense height in the air, and can fly in all directions, turning about with great rapidity; and an instance is recorded of a specimen of *Æshna* having been captured more than six hundred miles out at sea, in a direct line from land.†

\* *Phil. Trans.*, vol. 22, p. 519.

† Mr. Newport's Address to Ent. Soc., 10th Feb, 1845, p. 12.

It is stated by Mr. Patterson that some of these insects appear to be attracted by particular colours.\*

They have also been observed to migrate in large bodies.†

Meineken states (*Naturforsch*, 6, 110), that he saw in a village in Anholt, on a clear day about four in the afternoon, such a cloud of dragon flies as almost concealed the sun, and caused great alarm to the villagers who were impressed with the idea that they were a swarm of locusts.

They have also been observed in Silesia; and mention is made in Kirby and Spence of Mr. Woolnough, of Hollesley in Suffolk, witnessing "such an army of the smaller dragon flies (*Agrionidæ*) flying inland from the sea, as to cast a slight shadow over a field of four acres as they passed.‡

Species of *Calepteryx* and *Agrions* may often be captured with the fingers in great numbers in the evening asleep, on rushes and aquatic plants by the margin of ponds, &c.

Having thus far attempted a slight description of the habits and peculiarity of this most beautiful and interesting class of insects, it only now remains to give the name and a brief description of each of the species figured which will be very concise, inasmuch as it has not been thought advisable to comprehend within the compass of this work those amplified and extensive descriptions which are accessible to all such as will consult the works of Charpentier, Vander Linden, and Stephens.

\* *Nat. Hist. Ins.* mentioned in Shakspear, p. 234.

† Kirby and Spence's *Int. to Ent.*, vol. 2, p. 10; and *Journal of the Proceedings of the Ent. Soc. of London*, 7 Dec. 1835, p. 81.

‡ Kirby and Spence's *Int. to Ent.*, vol. 2, p. 10.



This Section of Insects may be divided into two families—

AGRIONIDÆ. *Leach.* Wings erect when at rest.

LIBELLULIDÆ. *Leach.* Wings horizontal when at rest.

## AGRIONIDÆ. LEACH.

### AGRION. Fabricius.

Named from *αγριος*—fierce or wild, in allusion to their habits.

Stigma rhomboidal.

The sexes of this genus differ much in colour, the males being generally brighter.

AGRION rubellum. Vander Linden. *Plate 3, fig. 1.* ♂

Figured in Stephen's *Illust. of Brit. Ent.* Vol. 6, *pl.* 29, *f.* 4. ♀  
Curtis. *Pl.* 732. ♂

SYNONYME tenellum. Vill.

This beautiful species measures, in length of body, from 14 to 15 lines.

Expanse of wings, from 17 to 18 lines.

It is usually found in June, and has been captured in the New Forest, at Weybridge, and occasionally near London.

The female has the abdomen partly black.

A. xanthopterum. Stephens. *Plate 3, fig. 2.*

Length of body, from 15 to 16 lines.

Expanse of wings, from 19 to 20 lines.

It has been captured during June near London.

This figure is from a specimen in the cabinet of James F. Stephens, Esq., to whom I am much indebted for many specimens of the insects here figured, and for much assistance towards this undertaking.

A. elegans. Vander Lin. *Plate 3, fig. 3, ♂ fig. 4. ♀*

Figured as tuberculatum. Charp. *Tab.* 38, *f.* 2.

SYNONYME ezonatum. Leach.

Length of body, 15 to 16 lines.

Expanse of wings, 17 to 18 lines.

This species appears to be common during June and July round London, in Kent, and other parts of the Country.

The Stigma on the wings of this species is only partly dark.

The female has the abdomen stouter than the male, with not so much blue on it, and the last segment without the tubercles.

*A. ezonatum.* Steph. *Plate 3, fig. 5.* ♀

Length of body, from 14 to 15 lines.

Expanse of wings, 18 to 19 lines.

The upper edge of the wings of this species is coloured, and the stigma is pale.

*A. rubens.* *Plate 3, fig. 6.*

Length of body, from 13 to 14 lines.

Expanse of wings, 17 to 18 lines.

This insect was found in Battersea Fields in July, 1844, and appears to be a very distinct species.

*A. Puella.* Linnæus. *Plate 3, fig. 7, ♂ fig. 8.* ♀

Figured as *lucifugum.* Harr. Exp. of Eng. Ins., *pl. 29, f. 5, 6.*

*interruptum.* Charp. *Tab. 40.*

Barbut *Genera Insectorum.* 208 *pl. 11*

\*SYNONYME *pulchella.* Vander Lin.

Length of body, from 15 to 17 lines.

Expanse of wings, from 19 to 20 lines.

This species occurs rather plentifully during June, about London and elsewhere; it is rather variable in colour, some specimens being much brighter than others.

*A. furcatum.* Charpentier. *Plate 4, f. 1, ♂ 2.* ♀

Figured in Charp. *Tab. 40.*

SYNONYMES *cingulatum.* Steph.

*puella.* Vander Lin.

Length of body, from 15 to 16 lines.

Expanse of wings, from 18 to 19 lines,

This insect is found rather abundantly during June and July round London, and elsewhere.

The wings of this species are narrower than those of *Puella*, from which it also differs in the marking of the last segment of the body. The head also, appears to be smaller.

*A. lunulatum*. Charp. *Plate 4, fig. 3*, ♂ 4. ♀

Figured in Charp. *Tab. 41, fig. 2*.

Length of body, 15 to 16 lines.

Expanse of wings, 18 to 19 lines.

This species may be known by the marking on the last segment of the body. It was taken in Battersea Fields during July last.

*A. hastulatum*. Charp. *Plate 4, fig. 5*, ♂ 6. ♀

Figured in Charp. *Tab. 41, f. 1*.

Length of body from 15 to 17 lines.

Expanse of wings, from 18 to 20 lines.

Found during June, near London, and in Kent.

*A. Cyathigerum*. Charp. *Plate 4, fig. 7*. ♂

Figured in Charp. *Tab. 22, f. 1*.

Length of body—16 to 18 lines.

Expanse of wings 20 to 21 lines.

This species was found towards the end of July, 1844, in Battersea Fields.

The Female is much darker than the male.

*A. brunnea*. *Plate 4, fig. 8*.

Length of body—15 to 16 lines.

Expanse of wings—20 to 21 lines.

This species was found in Battersea Fields during July 1844. The wings are narrow, and particularly acute at the end, and the nervures are irregular.

*A. annulare*. Leach. *Plate 5, fig. 1*. ♀

Figured as *æreum* in Harr. Exp. of Engl. Ins., *pl. 29, figs. 3, 4*.

Length of body, from 16 to 17 lines.

Expanse of wings, from 19 to 20 lines.

This species is found during June round London.

*A. rufescens*. Leach. *Plate 5, fig. 2*. ♂

SYNONYME *fusca*. Vander Lin.

Length of body, from 15 to 16 lines.

Expanse of wings, from 20 to 21 lines.

Found during June, in the neighbourhood of London, and elsewhere.

The Female is stouter at the apex of the abdomen.

## PYRRHOSOMA. Charpentier.

Named from *πυρρὸς* red, and *σωμα* body, the colours of both sexes being generally red.

The hairs on the insects of this genus are longer than in the preceding; they are also of a larger size, and the cross nervures of the wings are straiter, and not so close.

PYRRHOSOMA minium. Charp. *Plate 5, fig. 3, ♂ 4. ♀*

Figured in Harr. Exp. Eng. Ins. *pl. 29, f. 1, 2.*

Donovon. Brit. Ins. Vol. I., *pl. 36, f. 2.*

Charp. *Tab. 36, f. 2.*

as nymphula. ♀ Sulz Hist. Ins. *Tab. 24, f. 5.*

puella. Barb. Gen. Ins. 208, p. 11.

SYNONYMES puella var. *b.* Lin.

Sanguineum. Lea.

Sanguinea. Vander Lin.

Length of body, from 16 to 17 lines.

Expanse of wings, from 20 to 23 lines.

This species is found abundantly during June round London, in Kent, Yorkshire, Devonshire, and other parts of the country.

It varies much in its markings and brightness of colour.

## ERYTHROMMA. Charpentier.

Named from *έρυθρος* red and *ομμα* eyes, in allusion to the colour of their eyes whilst alive.

ERYTHROMMA fulvipes. Stephens. *Plate 5, fig. 5. ♀*

Length of body, about 17 lines.

Expanse of wings, about 24 lines.

This appears to be an uncommon species, but has been taken during June, at Coombe Wood, and at Ripley.

The figure is taken from a specimen in Mr. Stephens' Cabinet.

E. Chloridion. Charp. *Plate 5, fig. 6. ♀*

Figured in Charp. *Tab. 37.*

Roesel 2 aquat. *Tab. 11, f. 6. ♂*

Schæf. Icon. *Tab. 121, f. 4, ♂ 5 ♀.*

SYNONYME. Lincolnienne. Steph.

Length of body— $16\frac{1}{2}$  lines.

Expanse of wings—23 lines.

This species is stated by Mr. Stephens, in his "Illustrations of British Entomology," to be found during June in Lincolnshire; and is figured from a specimen in his cabinet.



The male is much darker in the body than the female, and has the eyes red, and the legs black.

The areolet of the wings appear to be much larger than in any other of the Insects of this family.

#### ISCHNURA. Charpentier.

Named from *ισχνος* slender, and *ούρα* form, in allusion to the peculiar shape of the body, from which the genus is founded.

ISCHNURA pumilio. Charp. *Plate 5, fig. 7. ♂*

Figured in Charp. *Tab. 39.*

Length of body—13 lines.

Expanse of wings—15 lines.

This singular species has recently been captured near Cambridge, and is figured from a specimen in Mr. Stephens' Collection.

The under part of the body is of a light grey colour.

The female is marked with orange colour, according to the figure in Mons. Charpentier's beautiful work on these insects.

#### PLATYCNEMIS. Charpentier.

Derived from *πλατυς* flat and *κνημια* leg, in allusion to the dilated tibiae which clearly distinguish this genus from the preceding ones.

PLATYCNEMIS platypoda. Vander Lin. *plate 6, fig. 1 ♂ 2. ♀*

Figured as lacteum. Charp. *Tab. 43, f. 2.*

SYNONYMES albicans and corea. Lea.

puella var. Fab.

albidellum var. Vill.

Length of body, from 16 to 17 lines.

Expanse of wings, from 22 to 24 lines.

This pretty insect may readily be distinguished by its flattened tibiae; and is found during July in Kent, at Ripley, in the New Forest, in Devonshire, and various other parts of the country.

The Female is figured from a specimen in Mr. Stephens' collection.

#### LESTES. Leach.

Named from *ληστής*, a robber, in allusion to the predatory habits of these insects.

Stigma oblong, and rather large.

LESTES viridis. Vander Linden. *plate 6, fig. 3. ♂*

Figured as virens. Charp. *Tab. 34, f. 3, 4.*

SYNONYMES sponsa. Kir.

Puella var a. Lin.

Length of body, from 17 to 18 lines.

Expanse of wings, from 20 to 21 lines,

This species occurs during June and July in Kent; and is also stated to be found in the New Forest, at Wanstead in Essex, and in Suffolk.

*L. nympha*. Kirby. Appears to be a dark variety of the preceding species, differing from it in having the legs of a redder colour, and the stigma black.

*L. forcipula*. Charp. *plate 6, fig. 4.* ♂

Figured in Charp. *Tab. 34, f. 1, 2.*

SYNONYME autumnalis. Lea.

Length of body, from  $15\frac{1}{2}$  to 19 lines.

Expanse of wings, from 18 to 22 lines.

This insect is found rather commonly during Autumn in the Marshes of Essex, in the New Forest, and occasionally in Battersea Fields, at which last place the specimen here figured (a remarkably small one) was captured in the middle of September, 1843.

#### CALEPTERYX. Leach.

Named from *καλος* beautiful, and *πτερον* a wing.

Areolets of the wings very close.

The males have no stigma, and the anal forceps large. The Females have the stigma white.

CALEPTERYX virgo. Lin. *plate 7, fig. 1,* ♂ 2. ♀

Figured Panz. Faun. Germ. fasc. 79 *Tab. 17* ♂

Petagna, tome 2, *Tab. 6, f. 3.*

Schæf. Icon. *Tab. 48, f. 3.* ♂

Rœsel. vol. 2 aquat. *Tab. 9 f. 7.* ♂

as Parthenias. Charp. *Tab. 33.*

splendeo. Harr. Exp. Eng. Ins., *pl. 30, f. 1.* ♂

Length of body, from 21 to 22 lines.

Expanse of wings, from 27 to 31 lines.

This species is found commonly about June round London, (especially in the Hackney Marshes) and elsewhere.

The male appears to be the more abundant; and varies considerably in the dark band across the wings, which, in some specimens, forms only a faint round mark. The wings of the female are yellowish.

*C. Ludoviciana*. Leach. *plate 7, fig. 3.* ♂ *plate 8, fig. 1* ♀

Figured as *virgo*. Barb. Gen. Ins. 207 p. 11.

*virgo*. Don. vol. I., *pl. 36 f. 1.*

*virgo*. Charp. *Tab. 31.*

*splendens*. Harr. Exp. Eng. Ins. *pl. 30, f. 2, 3.*

SYNONYME *virgo*. *var. d.* Lin.

Length of body, from 22 to 23 lines.

Expanse of wings, from 29 to 33 lines.

This species, which may readily be distinguished from the preceding one, by the wings being longer and narrower, and those of the female being greenish, is equally abundant round London and elsewhere.

*C. hæmorrhoidalis*. Vander Lin. *plate 8, fig. 2* ♂ *3.* ♀

SYNONYME *xanthostoma*. Charp.

Length of body, from 22 to 23 lines.

Expanse of wings, from 29 to 33 lines.

This insect was found in abundance during July, 1843, by the margin of a small stream near Blean Wood, Canterbury; and has also been captured near Horsham, Sussex.

It may readily be known from the preceding species by the male having the whole of the wings, *except at the base*, dark, and the female having the under wings of a much darker brownish or yellowish tinge than the upper ones. Both sexes, however, vary much in the depth of the colouring of their wings.

It also, like the preceding species, has the wings narrow and long. The base of the abdomen and breast underneath, are rufescent.

*C. anceps*. Stephens. *plate 9, fig. 1.* ♂

Figured as *vesta*. Charp. *Tab. 32.* ♂

*splendeo*. Harr. Exp. Eng. Ins., *pl. 30, f. 4.* ♂

Length of body, from 20 to 24 lines.

Expanse of wings, from 29 to 33 lines.

This species, which has been found during June near Canterbury, at Lindfield, Sussex, and elsewhere, may readily be distinguished by the very close texture of the wings and somewhat different neuration; and it is also a smaller insect than the preceding species.

#### LIBELLULIDÆ. Leach.

Head, globular.

ANAX. Leach.

Stigma long.

Wings very long and narrow.

*ANAX formosa*. Vander Lin. *plate 9, fig. 2.* ♀

Figured in *Ann. de la Soc. Ent.* Tom. 17. *Tab. 5, f. 1.* ♂

as *azurea*. Charp. *Tab. 17, ♂ Tab. 45.* ♀

SYNONYME *Imperator*. Lea.

Length of body, from 3 inches to 3 $\frac{1}{4}$ .

Expanse of wings, from 4 inches to 4 $\frac{1}{2}$ .

This handsome insect is not uncommon during the months of June and July in many neighbourhoods round London, and at Herne, Kent.

The female has the abdomen fuscous at the base.

*ÆSHNA*. Fabricius.

Derivation of this name obscure.

Stigma oblong—wings broad.

*ÆSHNA rufescens*. Vander Lin. *plate 10, fig. 1.* ♂

SYNONYME *Dalii*. Leach.

Length of body, from 2 inches 3, to 2 inches 7 lines.

Expanse of wings, from 3 inches to 4 inches 8 lines.

This species is figured from a specimen in Mr. Stephens' cabinet, and is stated to be common at Yarmouth, and Whittlesea Mere, and to be occasionally found near London.

It may readily be known by the accessory membrane of the wings being dark.

*Æ. grandis*. Lin. *plate 10, fig. 2.* ♂

Figured in Charp. *Tab. 24.*

Burton's *Lect. on Ent.*

Donovan. vol. 10, *pl. 337. f. 2.*

Harr. *Exp. Eng. Ins. Tab. 12, f. 1.*

Roesel. vol. 2. *quat. Tab. 4, f. 13, 14.*

Schæf. *Icon. Tab. 60, f. 1, ♂ Tab. 3, f. 4.* ♀

SYNONYME *flavipennis*.

De Geer. *Tome 2. Tab. 20, f.* ♂

4 *fasciata*. Mull.

Length of body, 2 inches 7 to 2 inches 9 lines.

Expanse of wings, 3 inches 10 to 4 inches.

This fine insect is common during summer and autumn about London, in Kent, Hampshire, Hertfordshire, Lincolnshire, and Devonshire.

The wings of the female are generally of a deeper yellow; and the inner margin of the hinder ones are rounded.



*Æ. maculatissima*. Latreille. *plate 11, fig. 1. ♂*

Figured as *varia*. Shaw's Zoology, vol. VI., 242, *pl. 80*.

*varia*. Wakefield's Intro. Nat. Hist. Ins. *pl. 10, f. 1.*

*grandis*. Barb. Gen. Ins. 206, *pl. 11.*

Don. vol. V., 77, *pl. 166.*

var, as *anguis*. Harr. Exp. Eng. Ins. *pl. 23, f. 4.*

*picta*. Charp. *Tab. 20.*

SYNONYME *œnea*. Sulz.

*viatica*. Lea.

Length of body, 2 inches 9 lines to 3 inches.

Expanse of wings, 3 inches 6 to 3 inches 8 lines.

This handsome species is not uncommon during the Autumn in the neighbourhood of London, in the New Forest, in Kent, Sussex, and Devonshire. The specimens figured were taken in Ridgway Wood, near Herne, Kent, where the species was rather abundant.

When alive the colours of the body are very brilliant.

The female has the inner margin of the hinder wings rounded.

*Æ. juncea*. Lin. *plate 11, fig. 2. ♂*

Figured as *grandis*. Petagna. tome II., *Tab. 6, f. 2. ♂*

Charp. *Tab. 23.*

Roesel. vol. II. aquat. *Tab. 2, f. 1, 2, var.*

Schaeff Icon. *Tab. 6, f. 10. ♂*

SYNONYME *rubicunda*. Oliv.

Length of body, 2 inches 8 to 2 inches 9 lines.

Expanse of wings, 3 inches 2 to 3 inches 3 lines.

This insect is figured from a specimen in Mr. Stephens' cabinet, and is stated by him to be found during July in Whittlesea Mere.

*Æ. mixta*. Latr. *plate 12, fig. 1. ♀*

Figured in Charp. *Tab. 19.*

as *coluberculus*. Harr. Exp. Eng. Ins. *pl. 27, f. 1. ♂*

SYNONYME *anglicana*. Lea.

Length of body, 2 inches 8 to 2 inches 9 lines.

Expanse of wings, 3 inches 2 to 3 inches 5 lines.

Figured from a specimen in Mr. Stephens' collection, and stated by him to be found occasionally about London, and in Essex.

The female has the eyes green; also the spots on the abdomen.

Æ. affinis. Vander Lin. *plate 12, fig. 2.* ♂

Figured in Charp. *Tab. 18.*

Ann. de la Soc. Ent. tome VIII., *Tab. 4, f. 1, 2.*

Length of body, 2 inches 6 lines.

Expanse of wings, 3 inches 2 lines.

This species is stated by Mr. Stephens to be of rare occurrence, but that it has been captured during July at Deptford and Hertford.

#### BRACHYTRON.

Named from *βραχυων*, to abbreviate, *ητρον*, abdomen, in allusion to its being short and stout; which, together with the different shape of its wings, and the pilose body, has induced me to separate it from *Æshna*.

BRACHYTRON vernalis. Vander Lin. *plate 13, fig. 1.* ♂

Figured as pilosa. Charp. *Tab. 21.*

Ann. de la Soc. Ent. tome VII., *Tab. 5, f. 2.* ♀

var, as aspis. Harr. Exp. Eng. Ins. *pl. 27, f. 3.*

Length of body, 2 inches to 2 inches 3 lines.

Expanse of wings, 2 inches 8 lines to 3 inches.

This species is found in the neighbourhood of London, at Hertford, and near Herne, Kent, during the month of June.

It appears to be rather variable as regards the brightness of the markings on the body.

The female has the wings yellow, and the thorax brown, and without the green marks thereon, which characterize the male.

#### CORDULEGASTER. Leach.

Derived from *Κορδυλη*, a club, and *γαστηρ*, belly, in reference to the form of the body.

Wings short and narrow.

CORDULEGASTER annulatus. Latr. *plate 13, fig. 2.* ♀

Figured as forcipata. Harr. Exp. Eng. Ins. *pl. 23, f. 3*

as Boltoni. Don. 12, *pl. 430.*

as lunulata. Charp. *Tab. 26.*

SYNONYME grandis. Scop.

Length of the body, 2 inches 8 lines to 3 inches.

Expanse of wings, 3 inches 4 to 3 inches 8 lines.

This fine insect is found during July, generally distributed throughout Great Britain, and is, I understand, plentiful in the New Forest.

The female differs in having the inner margin of the hinder wings rounded.

#### GOMPHUS. Leach.

Derived from *γομφος*, a wedge, probably in allusion to the shape of the apex of the abdomen.

Eyes far apart.

GOMPHUS vulgatissimus. Lin. *plate 14, fig. 1.* ♂

Figured as forcipatus. Don. 12, *pl. 423.*

forcipata. Charp. *Tab. 28.*

Schaeff. *Icon. Tab. 160, f. 1.* ♂

Sulz. *Tab. 35, f. 10.* ♂

Roesel. vol. II. *quat. Tab. 5, f. 3.* ♀

Panz. *Faun Germ. fasc. 88, Tab. 21.* ♂

Length of body, 1 inch 9 to 1 inch 11 lines.

Expanse of wings, 2 inches 5 to 2 inches 6 lines.

This handsome species is stated by Mr. Stephens to be found during July and August in Kent, and round London.

The female has the caudal appendage very short.

G. flavipes. Charp. *plate 14, fig. 2.* ♂

Figured in Steph. *Illus. Brit. Ent. vol. VI., pl. 30, f. 1.*

Charp. *Tab. 29.*

SYNONYME pulchellus. Steph.

forcipatus. var. b. Vander Lin.

Length of body, 1 inch 10 lines.

Expanse of wings, 2 inches 6 lines.

This beautiful and rare insect was captured by Mr. Stephens near Hastings, in August, 1818, and is figured from a specimen in his cabinet.

#### CORDULIA. Leach.

Name derived from *Κορδουλῆ*, a club, in allusion to the shape of the body.

Metallic—Legs rather long.

*CORDULIA œnea*. Lin. *plate* 14, *fig.* 3. ♂

Figured in Schaeff. Icon. *Tab.* 167, *f.* 4. ♀ *Tab.* 182, *f.* 1.

Panz. Faun Germ. fasc. 88, *Tab.* 20.

Charp. *Tab.* 14.

De Geer. tome II., *Tab.* 19, *f.* 8, 9.

Roesel. tome II., *Tab.* 5, *f.* 2.

Don. 12, *pl.* 415.

Sow. Brit. Misc. vol. I., *pl.* 47.

Length of body, from 1 inch 10 lines to 2 inches.

Expanse of wings, from 2 inches 8 to 2 inches 10 lines.

The species occurs in the neighbourhood of London about June.

The female may be known by the wings being yellowish.

*C. metallica*. Vander Lin. *Plate* 15, *fig.* 1. ♂

Figured as *œnea* in Harr. Exp. Eng. Ins. *pl.* 27, *f.* 2.

Schaeff. Icon. *Tab.* 113, *f.* 4. ♂

Charp. *Tab.* 15.

Length of body, 1 inch 11 lines.

Expanse of wings, 2 inches 9 to 2 inches 10 lines.

This insect is stated by Mr. Stephens to occur, though rarely, during June round London, and is figured from a specimen in his cabinet.

The female has the wings yellowish, and the body of a uniform stoutness.

*C. Curtisii*. Dale. *Plate* 15, *fig.* 2, ♂ 3. ♀

Figured in Curtis. *pl.* 616. ♀

as *flavomaculata*. Charp. *Tab.* 16.

SYNONYME *compressa*. Steph.

Length of body, 2 inches to 2 inches 2 lines.

Expanse of wings, 2 inches 10 lines to 3 inches.

The figures of this beautiful insect are from specimens in Mr. Stephens' cabinet; and the species is stated to occur near Brockenhurst, New Forest, during the months of June and July.

*C. Alpestris*. Has recently been captured in Scotland, but I regret to say that I am unable to give a figure of it.

#### LIBELLULA auctorum.

Formerly called *Libella*, derivation of the name obscure.

*LIBELLULA depressa*. Lin. *Plate 16, fig. 1, ♂ 2. ♀*

Figured Harr. Aur. *pl. 26.*

Don. vol. I., *pl. 26, ♀* vol. III., *pl. 81, ♂* vol. II., *pl.*

44, larvæ

Schæff. Icon. *Tab. 106, f. 1, ♂ Tab. 52, f. 1. ♀*

Panz. Faun. fasc. 89, *Tab. 22. ♂*

Charp. *Tab. 4.*

Reaum. tome VI., *Tab. 35, f. 2, ♂ f. 1. ♀*

Rœsel. vol. 2 aquat. *Tab. 7, f. 3. ♂*

Geoffr. tome II., *Tab. 13.*

Petagna. tome II., *Tab. 6, f. 1.*

Length of body, from 1 inch 8 to 1 inch 10 lines.

Expanse of wings, from 2 inches 10 lines to 3 inches.

This species is very common during Summer round London, in Sussex, Kent, and indeed appears to be generally distributed.

*L. conspurcata*. Fab. *Plate 16, fig. 3. ♀*

Figured in Sow. Brit. Misc. vol. I., *pl. 46.*

Charp. *Tab. 2.*

as 4 fasciata. Don. 12, *pl. 425.*

fugax. Harr. Exp. Eng. Ins., *pl. 46, f. 2.*

Length of body, from 1 inch 7 to 1 inch 9 lines.

Expanse of wings, from 2 inches 7 to 2 inches 9 lines.

The wings of this species vary, in being sometimes yellowish, and in having the tips of them clear or dark.

It is found during June round London, near Herne Bay, in Kent and at other places.

In the male the abdomen is not so stout, the anal appendages are longer, and the tips of the wings are lighter.

*L. 4 maculata*. Lin. *plate 17, fig. 1. ♂*

Figured in Charp. *Tab. 3.*

Barbut. Gen. Ins. 207, *pl. 11.*

Don. 11. *pl. 407.*

Samouelle's Useful Comp. *pl. 7, f. 1.*

as maculata. Harr. Exp. Eng. Ins. *pl. 46, f. 1.*

De Villers. *Tab. 46, f. 1.*

var. Schæff. Icon. Ratisb. *Tab. 9, f. 13.*

Panz. fasc. 88, *Tab. 19. ♀*

Length of body, 1 inch 10 lines to 2 inches.

Expanse of wings, 2 inches 10 lines to 3 inches.



This species, which is found during June and July in Kent, Essex, and elsewhere, varies much in the costal spots on the wings, which in some specimens are of a very faint colour and small.

The body of the female is stouter than that of the male, and has the marginal spots larger.

*L. 2 maculata*. Charp. Appears to be a variety of the preceding species; from which it differs in the wings being without the dark costal mark, and in having more dark marks on the body.

*L. prænubila*. Newman. *plate 17, fig. 2. ♂*

Length of body, about 2 inches.

Expanse of wings, about 3 inches 2 lines.

This Insect is considered by some as a large and dark variety of the preceding species.

It is found near Epping, Godalming, and in Cambridgeshire, early in July, and is figured from a specimen in Mr. Stephens' Cabinet.

*L. cancellata*. Lin. *plate 17, fig. 3, ♂ plate 18, fig. 1. ♀*

Figured in Don. 14, *pl. 472*.

Kirby and Spence, *Int. to Ent. vol. I., pl. 3, f. 5*.

Schæff. *Icon. Tab. 206, f. 3. ♂*

Charp. *Tab. 5*.

Length of body, 1 inch 10 lines.

Expanse of wings, 3 inches 1 to 3 inches 2 lines.

This insect is figured from specimens in Mr. Stephens' cabinet, who states that the species is found during June in Kent and elsewhere.

*L. cærulescens*. Fab. *plate 18, fig. 2, ♂ 3. ♀*

SYNONYME *Donovani*. Lea.

Figured as *biguttata*. Don. 13, *pl. 449*.

Charp. *Tab. 6*.

Schæff. *Icon. Tab. 206, f. 1, 2, ♂ Tab. 174, f. 1. ♀*

*Ann. de la Soc. Ent. tome VI., Tab. 5, 6*.

This pretty species is figured from specimens in Mr. Stephens' collection.

The insect generally occurs in June, and is found in the neighbourhood of London.

#### DIPLAX Charp.

Name derived from  $\delta\iota\varsigma$ , smooth, and  $\pi\lambda\alpha\zeta$ , surface, or place, in allusion to the prothorax.

This Genus is formed from the peculiar form of the prothorax. The general appearance of the insects seems to point out that they should be divided from the preceding species.

**DIPLAX SCOTICA.** Leach. *plate 19, fig. 1, ♂ 2. ♀*

Figured in Millard's Outlines Brit. Ent. *pl. 1, f. 4.*

Length of body, 1 inch 1 line to 1 inch 2 lines.

Expanse of wings, 1 inch 6 to 1 inch 7 lines.

This species is abundant in Scotland, and is also found at Epping.

Besides other characters, it may be readily distinguished from the following species, by the legs being entirely black.

**D. rufostigma.** Newman. *plate 19, fig. 3, ♂ 4. ♀*

Figured as *nigripes*. Charp. *Tab. 10, f. 1.*

Length of body, from 1 inch 4 to 1 inch 5 lines.

Expanse of wings, from 2 inches 10 lines to 3 inches.

This species is found during July; and I have captured specimens towards the end of September in Battersea fields.

It may readily be known from the preceding, by the *coxæ* of the fore legs being brown.

**D. pallidistigma.** Steph. *plate 20, fig. 1.*

Length of body, 1 inch 3 lines.

Expanse of wings, 1 inch 10 lines.

Figured from a specimen in Mr. Stephens' possession, who states the species occurs in the New Forest during June.

The body is much compressed.

**D. angustipennis.** Steph. *plate 20, fig. 2.*

Length of body, 1 inch 3 lines.

Expanse of wings, 2 inches 1 line.

This species is also figured from a specimen in the possession of Mr. Stephens. The insect is found during June near London.

**D. vulgata.** Lin. *plate 20, fig. 3. ♂*

Figured in Harr. Exp. Eng. Ins. *pl. 46, f. 3.*

Charp. *Tab. 11, f. 1.*

Don. 10, *pl. 337.*

**SYNONYME sanguinea.** Mull.

Length of body, from 1 inch 4 to 1 inch 8 lines.

Expanse of wings, from 2 inches to 2 inches 4 lines.

Abundant during July and August round London and elsewhere.

It varies very much in size and colouring.

*D. basalis.* Steph. *plate 21, fig. 1.*

SYNONYME *Roeselii.* Curt.

Length of body, from 1 inch 3 to 1 inch 4 lines.

Expanse of wings, from 1 inch 11 to 2 inches 1 line.

Figured from a specimen in Mr. Stephens' collection. This species has been taken during June and July at Colney Hatch, at Deptford, and at Epping.

*D. flaveola.* Lin. *plate 21, fig. 2. ♂*

Figured in Harr. Exp. Eng. Ins. *pl. 46, f. 4.*

Charp. *Tab. 9.*

Schaeff. Icon. *Tab. 4, f. 1. ♀*

This species is found in Scotland, at Whittlesea Mere, and at Epping.

The body of the female is stouter, and the colouring of it not so bright.

*D. rubicunda.* Schaeff. *plate 21, fig. 3. ♂*

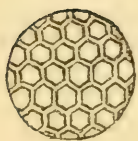
Figured in Curtis. *pl. 712.*

as *pectoralis.* Charp. *Tab. 13.*

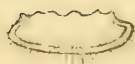
This pretty insect is figured from a specimen in Mr. Stephens' cabinet, who states that it has been found at Epping.

The stigma of this species appears to be particularly small.

The female has the body shorter and stouter than the male.



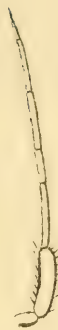
1.



7.



2.



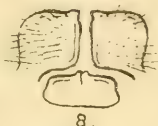
3.



4.



5.



8.



6.



9.



10.

a.



11.

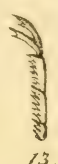


11. a.



12.

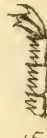
a.



13.



14.



15.



16.

a.

b.

c.

d.

e.



17. a.



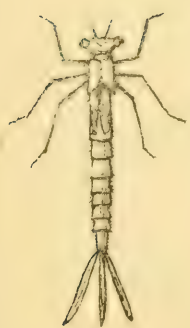
18.



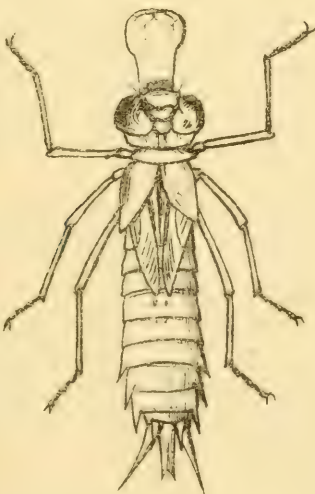
18. a.



18. b.



19.



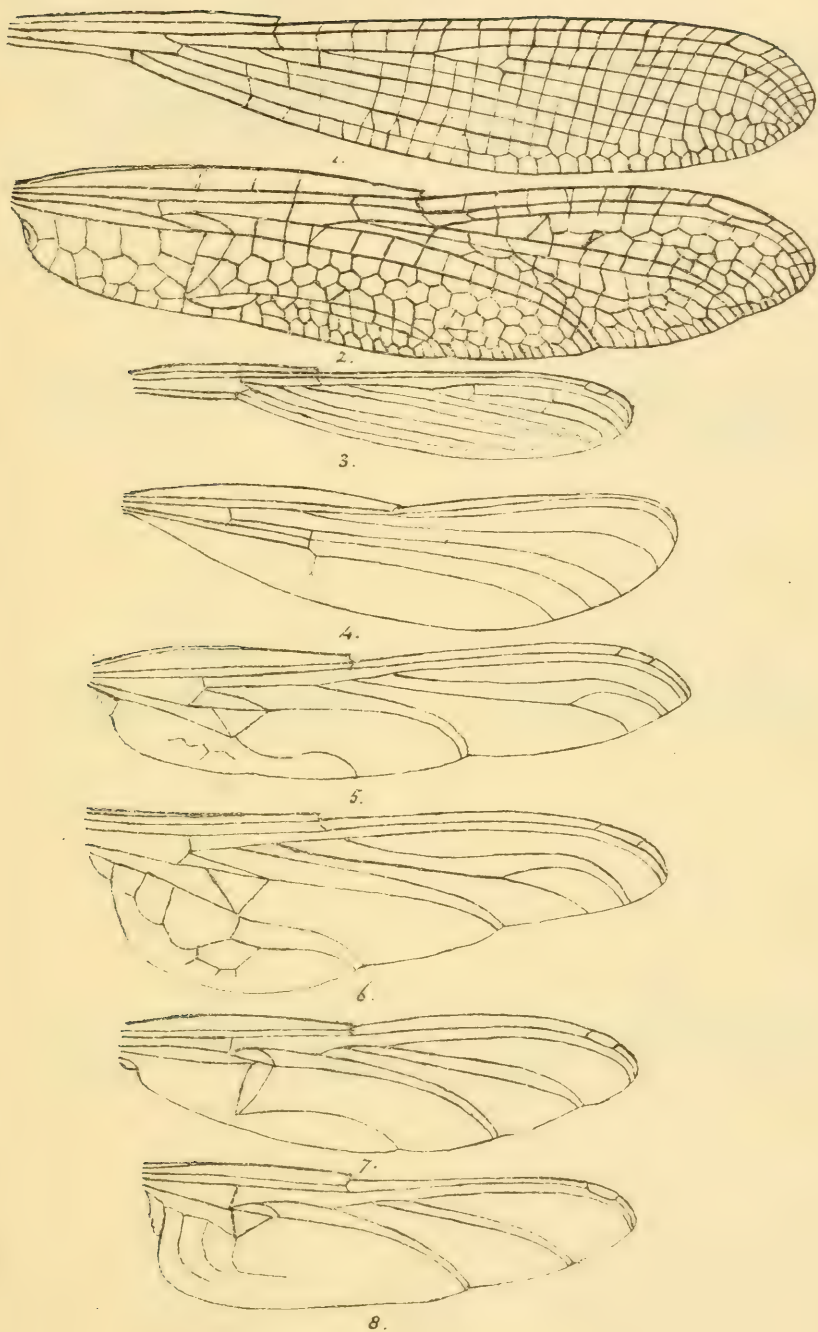
20.



21.











1.



5.



2.



6.



3.



7.

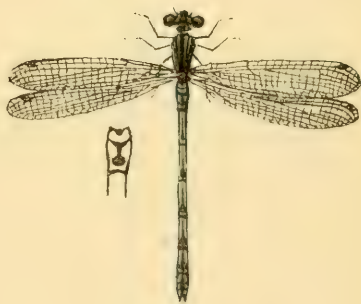


4.



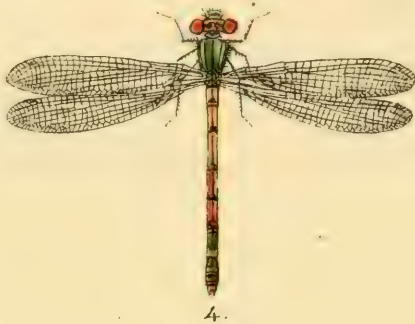
8.











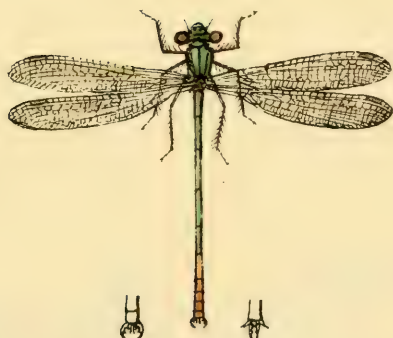




Z.



2.

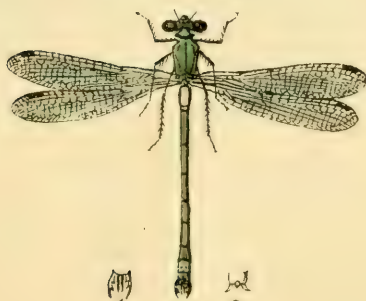


♂



♀

3.



♂



♀

4.







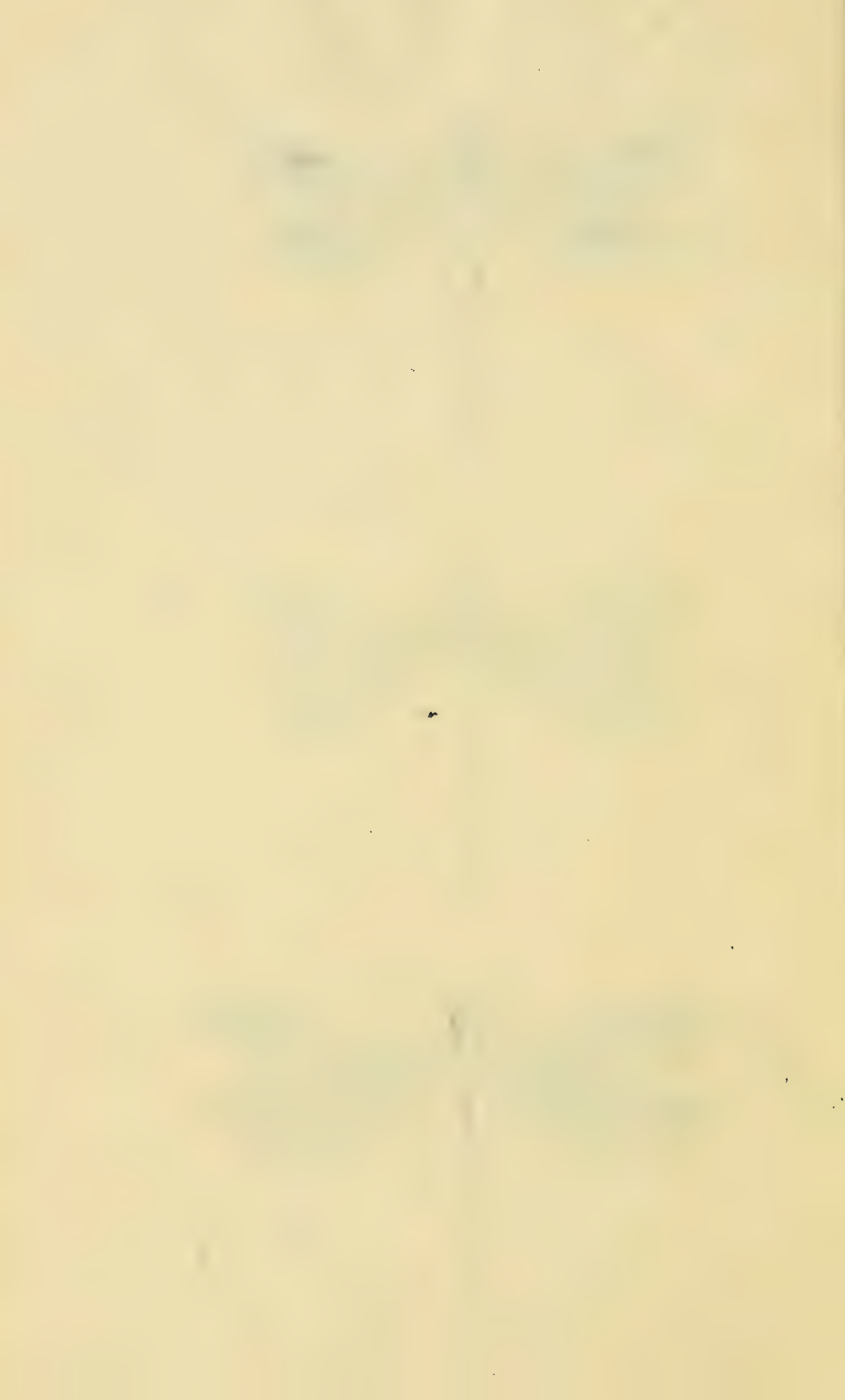
1.

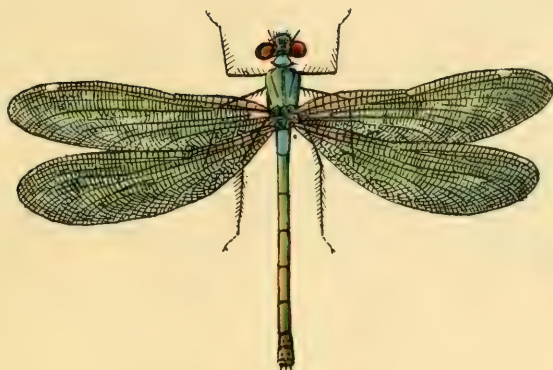


2.



3.





1.

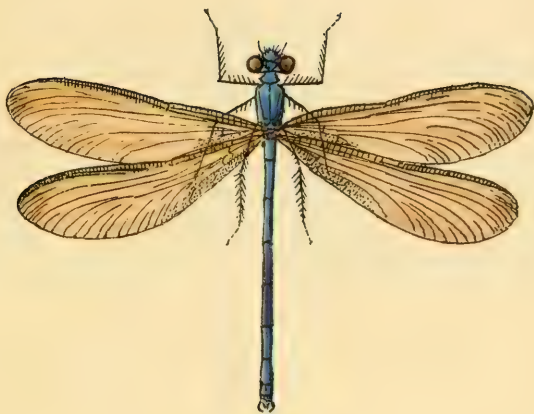


2.

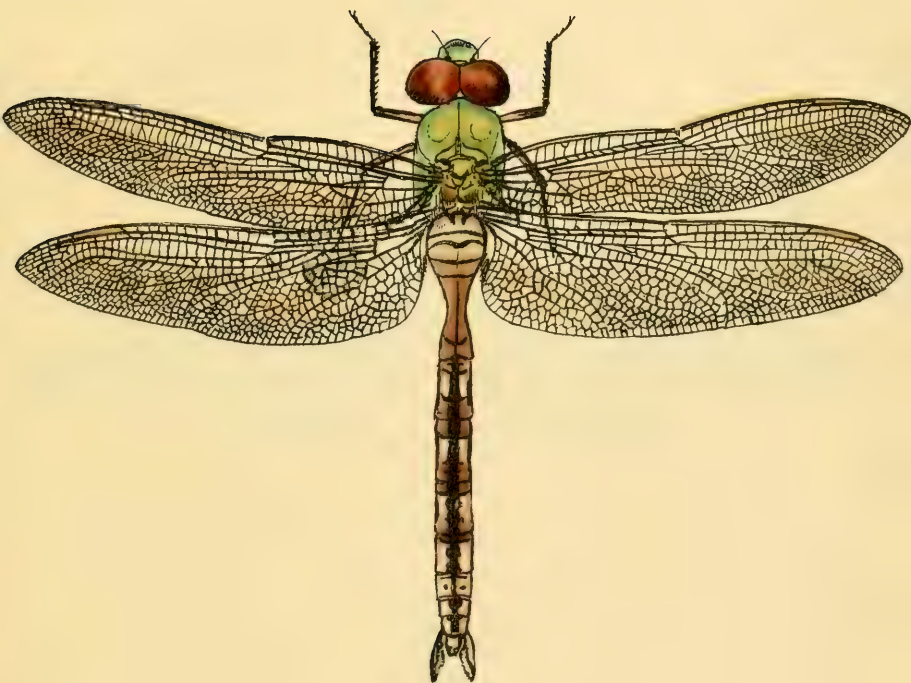


3.





7.



2.







1.



2.





1.



2.







1.



2.



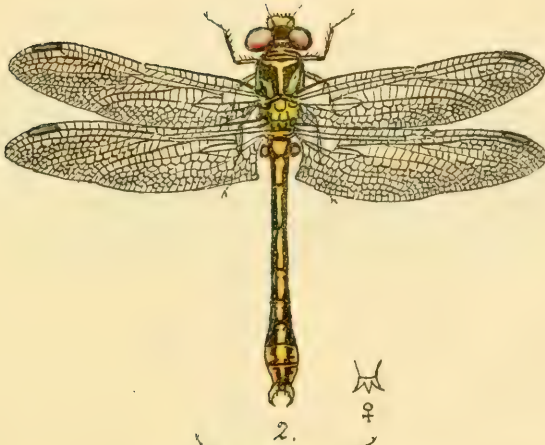


1.

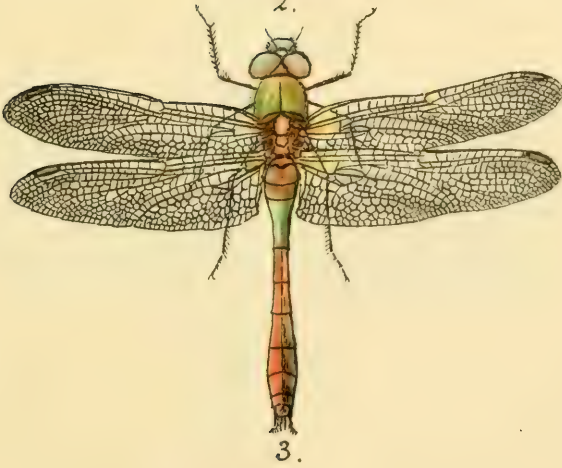


2.



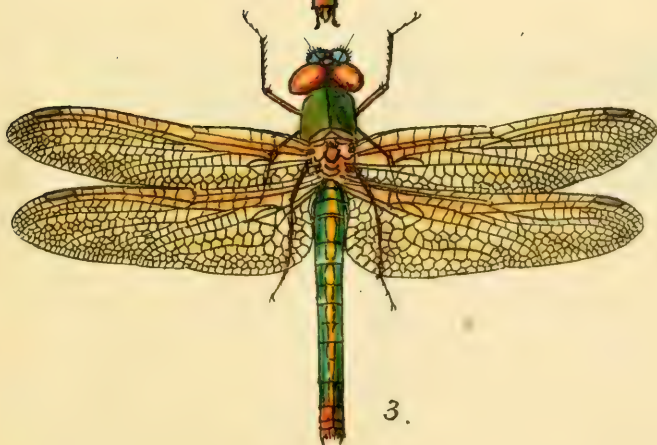


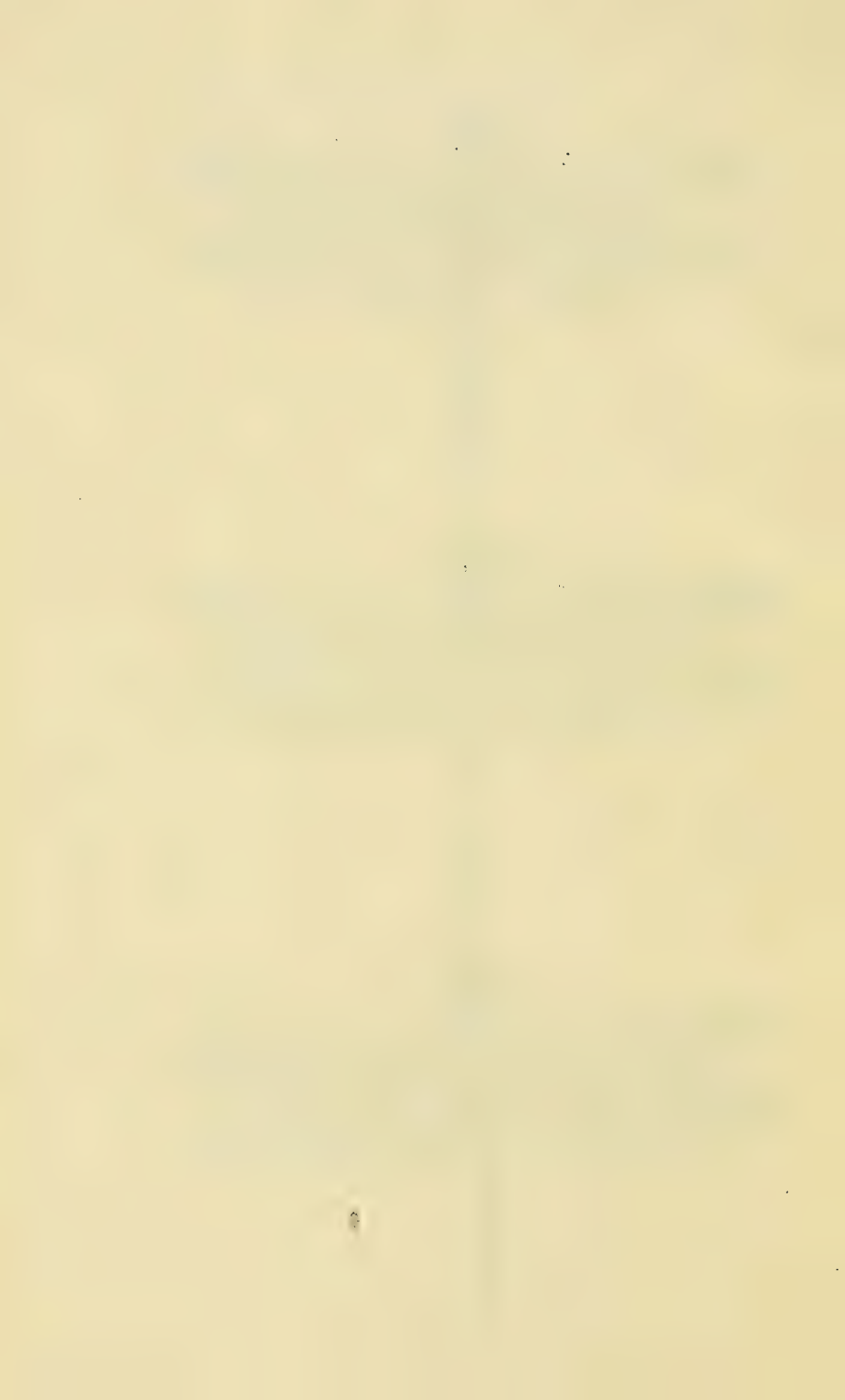
♀

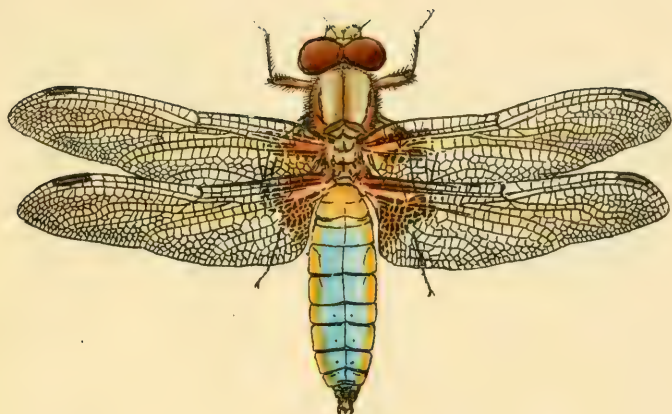




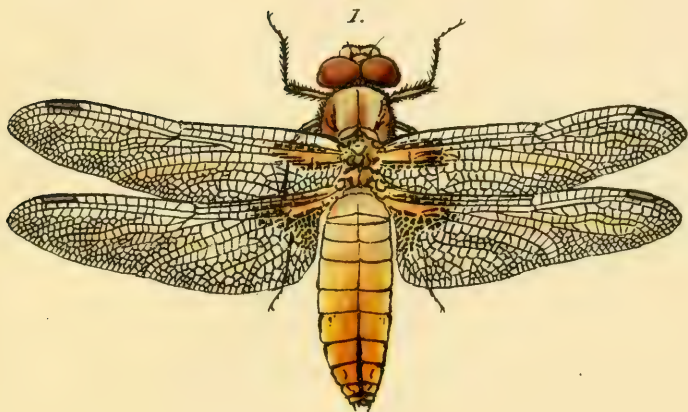




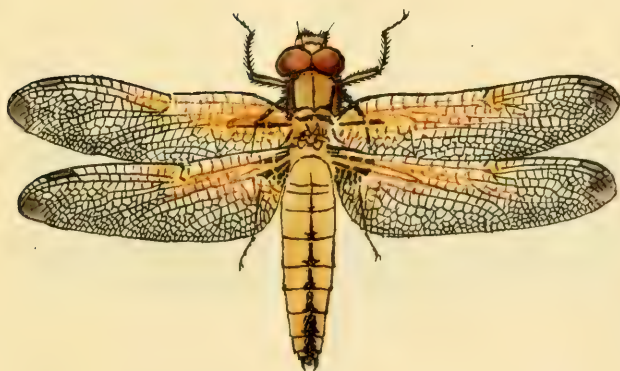




1.

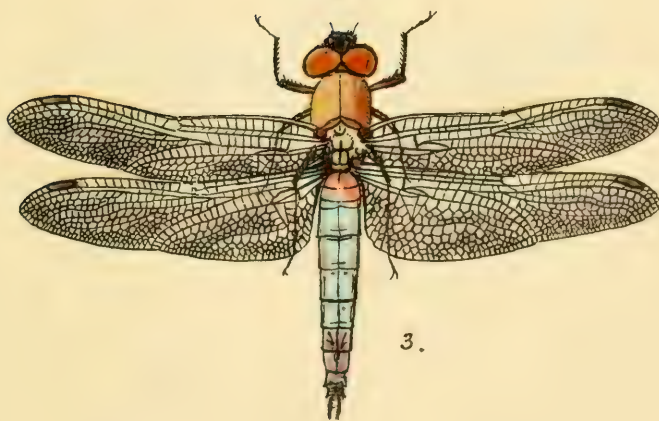
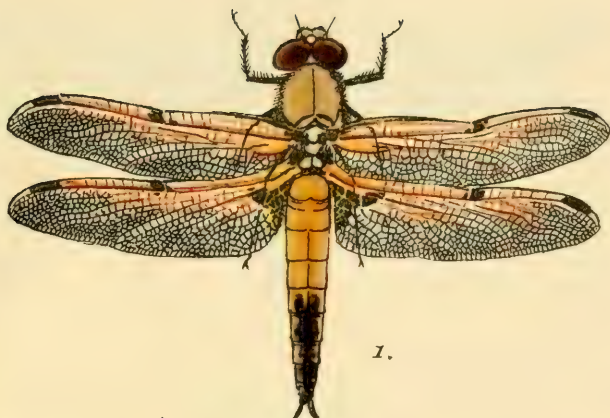


2.



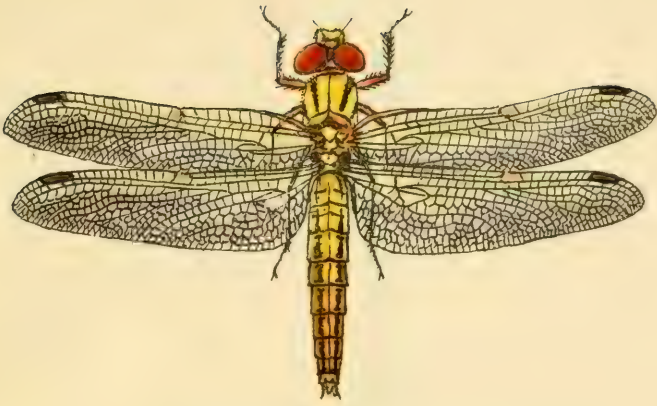
3.







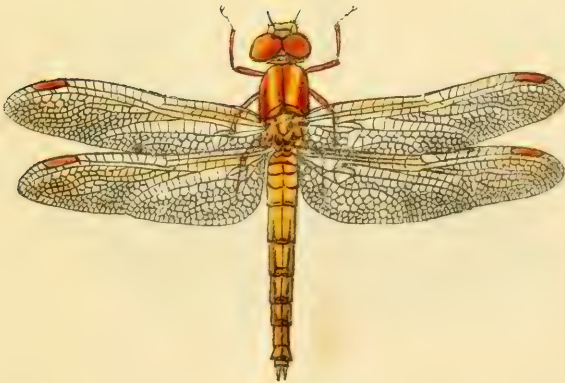




1.

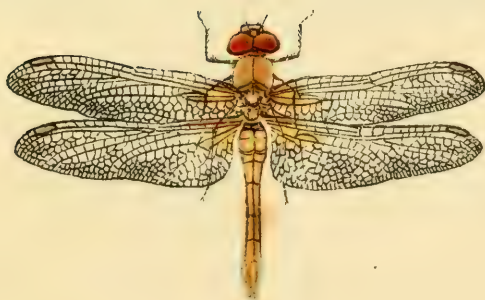
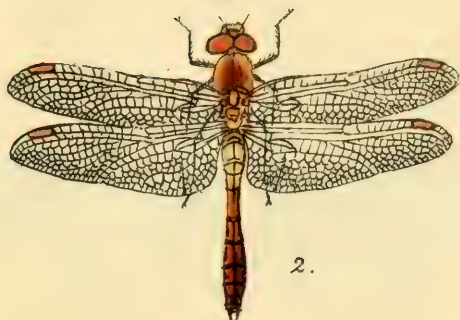


2.



3.

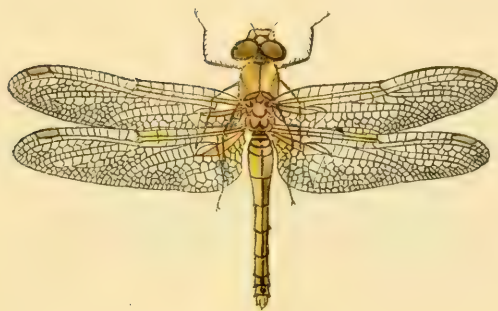








1.



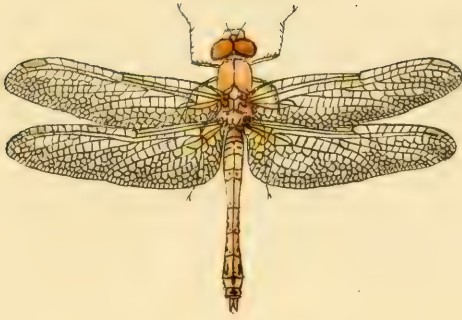
2



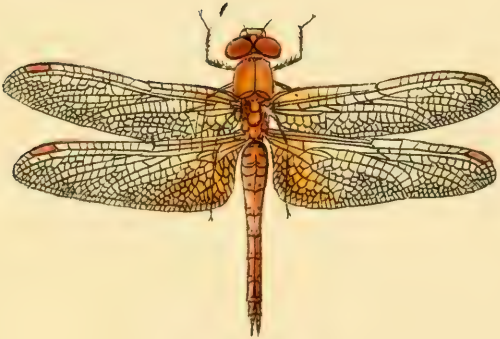
3.







1.



2.



3











